2 Background

This section, of the report, discusses trends affecting transportation decisions and local desires.

2.1 The External Environment

The MPO used the PESTEL analysis to identify factors that will affect transportation during the transportation planning period. PESTEL stands for political, economic, technological, environmental, and social factors analysis(Person, 2009).

2.2 Political Factors

On June 21, 2012, Congress passed the latest surface transportation authorization bill, entitled Moving Ahead for Progress-in the 21st Century Act (MAP-21). Although it is nominally a three year bill, one year of the authorizations is retroactive leaving only two years of funding available. MAP-21 continues funding at current levels until 2014, making it effectively a two year bill. MAP-21 is a stop-gap bill. However, it does include some features that will affect transportation delivery. Features of MAP-21 include:

- A bigger Transportation Infrastructure Finance and Innovation Act (TIFIA) Program,
- Required performance measures,
- More opportunities for tolling interstates,
- Program Consolidation (*e.g.,* Safe Routes to School and Recreational Trails),
- Environmental Streamlining, and
- Operating Assistance for small transit systems in urbanized areas.

"There is no appetite in Congress to increase the gas tax"(Orski, 2012). Simply put, *tax increases are out of favor*. Many believe that taxes are too high and that the government is wasteful. During the 2012 Legislative Short Session, the legislature capped the motor fuels tax at 37.5¢ per gallon for a year. In Atlanta voters rejected a $7.2 billion transportation bond referendum that would have given money to specific projects(Hart, 2012). The national gasoline tax has not been raised in over twenty years and remains 18.4 ¢/gallon despite its falling purchasing power.

The increases in the **TIFIA program** and the additional **tolling options**, in MAP-21, may imply that Congress is shifting from an infrastructure funding philosophy to an infrastructure financing philosophy. In 2005, the New York Times called tolling the biggest change in transportation policy since the Interstate Highway system was created. Nevertheless, while toll roads may be the lion's share of new roads in the future; the public opposes converting existing freeways to toll roads.

The *mortgage tax credit* supports the United States', seventy year, goal of increasing home ownership. The mortgage tax credit makes single family detached housing more economically competitive and is a driver for the transportation system because most suburban neighborhoods have neither the urban form nor the density to be effectively served by public transit(Glaser, 2011).

The biggest political changes affecting transportation, in North Carolina, are:

- NCDOT's 2040 Plan anticipates a funding shortfall of $40 billion for the next thirty years (NCDOT, 2012). NCDOT has considered several options for meeting the state's transportation needs. These options include new revenues as well as big changes in the relationship between state and local government. Options discussed in the 2040 plan include new, or different, revenue streams such as a VMT tax, interstate tolls, and local option taxes as well as re-evaluating responsibilities for some parts of the transportation system(Atkins, 2012).

- In 2005, NCDOT began reporting its performance on a range of issues including system performance, system health, project delivery, and employee satisfaction. The performance dashboard is seven years old, and we have enough information to begin using it to improve spending decisions. The performance dashboard is providing information that should be useful at the statewide level. For instance, the legislature has asked for more spending on bridges over the past few years and bridge condition is improving across the state. However, pavement condition on secondary roads (in Divisions 7, 8, and 9) is falling. The Sparkline graphs below show how the local Divisions are trending on all elements of NCDOT's performance dashboard.

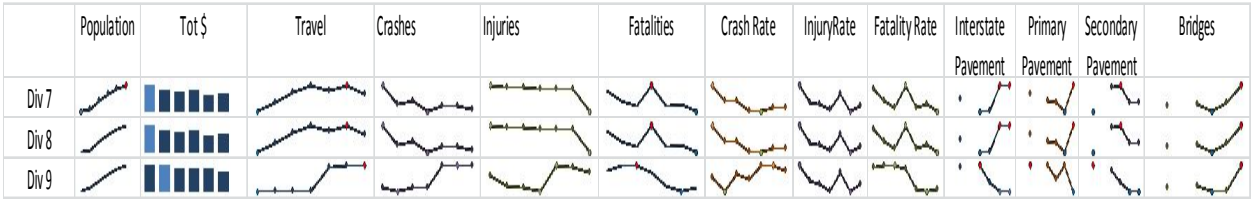


Figure 2-1: NCDOT System Performance Measures for MPO Counties

- NCDOT's *objective project prioritization system*. The Strategic Planning Office of Transportation (SPOT) has developed prioritization systems for TIP projects, the Urban Loop Program, and the Mobility fund. Alongside this change, the legislative leadership is no longer writing specific projects into law which should give NCDOT more flexibility to pursue better projects.

- North Carolina is more urban than in the past. This trend changed *the legislature's, power structure as urban coalitions developed*. This trend will probably be stronger after the redistricting caused by the 2010 census.
- In addition, the midterm elections in 2010 resulted in a more fiscally conservative legislature. The new legislature's impact on transportation is still unfolding.
- Despite being more urban, the legislature has moved to limit money going to transit.

2.3 Economic Factors

Gross Domestic Product- Since 2004, North Carolina's gross domestic product (GDP) has grown by 7.3%. This is faster than the US as a whole and faster than five of six comparison states(North Carolina Department of Commerce, 2011).

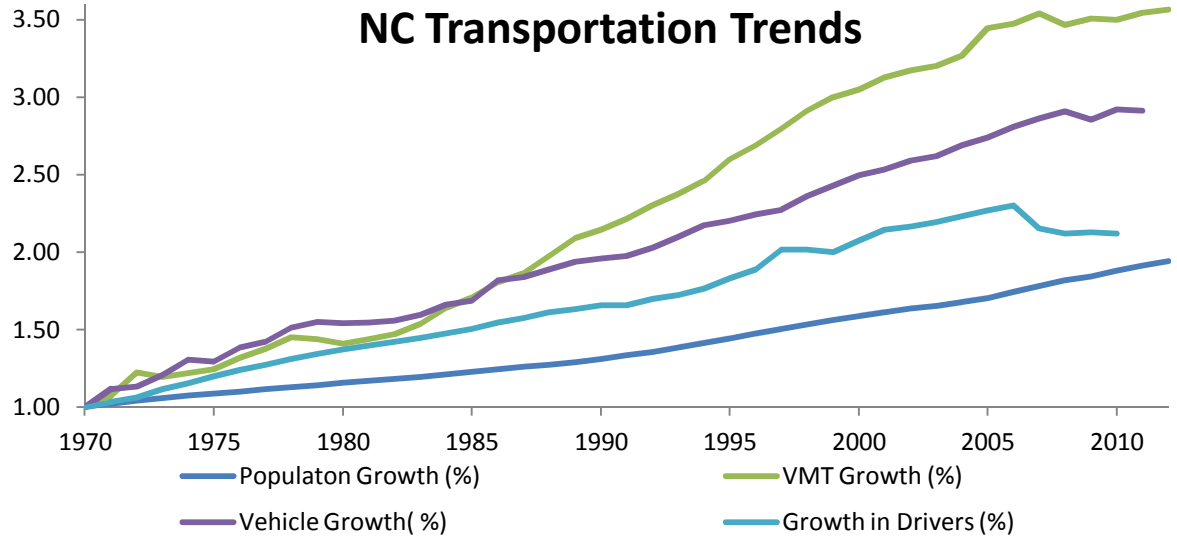
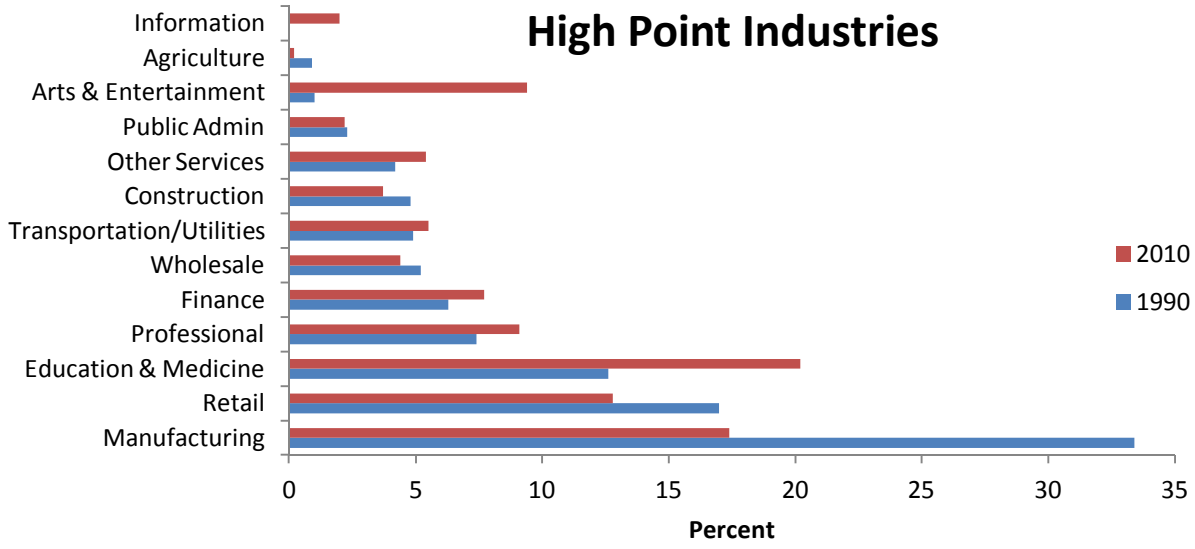


Figure 2-2: NC Transportation Trends

At the same time, North Carolina's economy has shifted from an agricultural and manufacturing economy to an economy depending upon knowledge and services. Figure 2-3 shows that High Point's economy has mirrored that of North Carolina. Since 1990, manufacturing in the High Point area has dropped from thirty-three percent of the workforce to seventeen percent of the workforce. At the same time, education, social work and medicine have grown from twelve percent to twenty-one percent of jobs.



Source: HP Planning After US Census

Figure 2-3: High Point's Economy

Since about 2005, median income in North Carolina has been declining when adjusted for inflation. The change in income is related to changes in the economy over the past twenty years. The transportation implications are that there will be less local money to pay for new projects and maintain the transportation system.

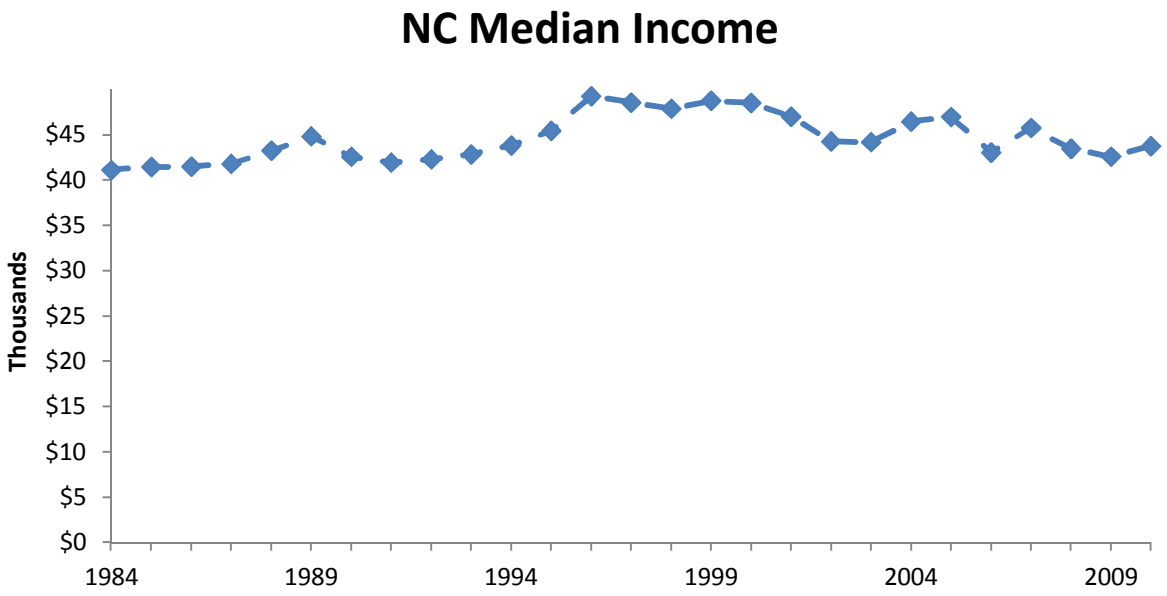


Figure 2-4: NC Median Income

Today ships using the Panama Canal must be less than 1000 feet long, 107 feet wide (beam), and 41 feet of draft (depth)1. About 37% of cargo ships are too big to use the Panama Canal[2]. However, the Panamanian government is improving the canal, adding larger locks and deeper channels. The widening will change ports of call for container ships. Alberto Zubieta, the Canal's former CEO says "this is the most significant change in the shipping industry since companies adopted the container ship in the 1960's"(Zubieta, 2012). Once larger vessels can use the Canal, ships from Asia can travel directly to Port Elizabeth, Norfolk, and other east, and gulf, coast ports. This realignment of shipping has implications for port access, trucking and rail. North Carolina ports are not deep enough to accommodate post Panamax ships so much of our commerce will come through the ports at Norfolk and Charleston.

2.4 Social Factors

Figure 2-5 shows how the High Point MPO's population has grown since 1990 in comparison to North Carolina's p**opulation growth.** Since 1990, North Carolina's population has grown from 6,630,000 to 9,540,000, roughly a 44% change, or 1.84% per year. Using the rule of 72(The Rule of 72, 2012) we can expect our population to double by about 2050. Most of our member jurisdictions are growing a little slower than the state as a whole, but Archdale, High Point and Thomasville are growing faster than the state.

[1] These dimensions are commonly called Panamax.
[2] 2012

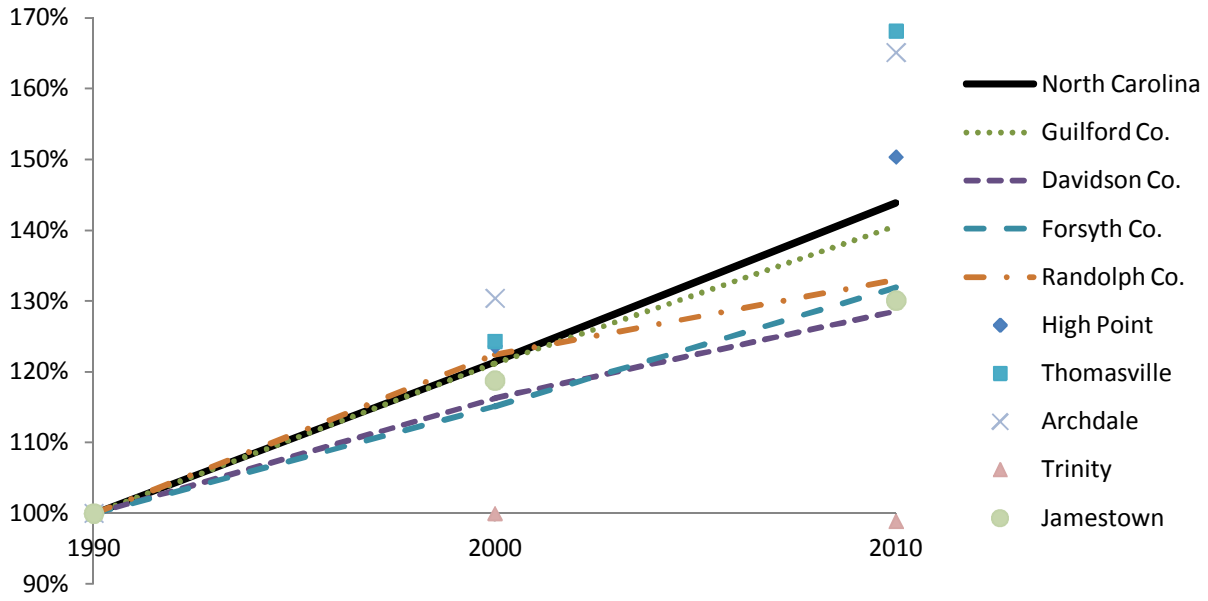


Figure 2-5: NC Population Growth

Aging Population- Between 2000 and 2010 North Carolina's median age rose from 35.3 years to 37.4 years. In High Point, the median age has moved up from 34.4 years, in 2000, to 35.8 years in 2010. Today about 63% of High Point's population is in the 18-64 age range. This age range is the primary working age population and tends to drive more than older and younger groups. There is also a population spike in the 15-19 age group associated with college students, mainly at High Point University(Piper, 2012).

Household size is declining in the nation, state and region. From 1990 to 2010, household size in the Triad declined from 2.48 persons per household to 2.41 persons per household. Smaller households mean a different mix of trips than from larger households. For example, there may be fewer childcare or education trips but more work and recreational trips.

Drivers Licensing- A key indicator of travel demand is the portion of the population that is licensed to drive. Figure 2-6 shows the percentage of North Carolina residents that are licensed to drive, beginning in 1970. Between 1970 and 2001, the portion of North Carolina's population with driving license increased until it reached a plateau at about seventy-one (71) percent. Beginning in 2006 the portion of licensed drivers has declined to around sixty-one (61) percent. The decline may be driven by a combination of delayed licensing for young people, unemployment, and an aging population. It is unclear if this trend will continue. It exists now and will likely persist for some time. The net effect will be to offset the effect of population growth on travel demand and lower fuel sales and fuel tax revenues.

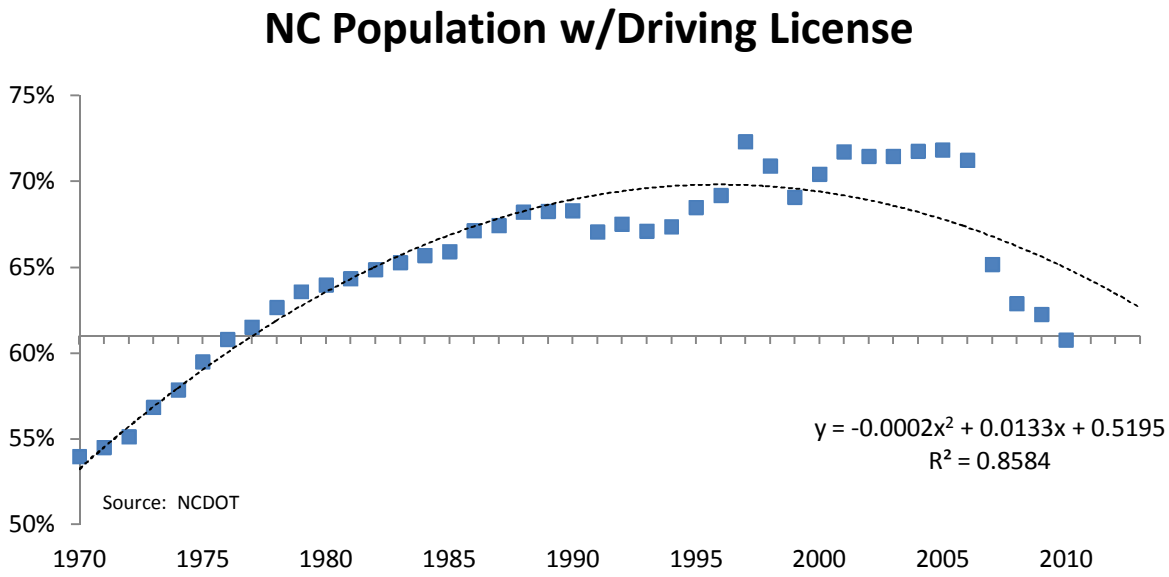


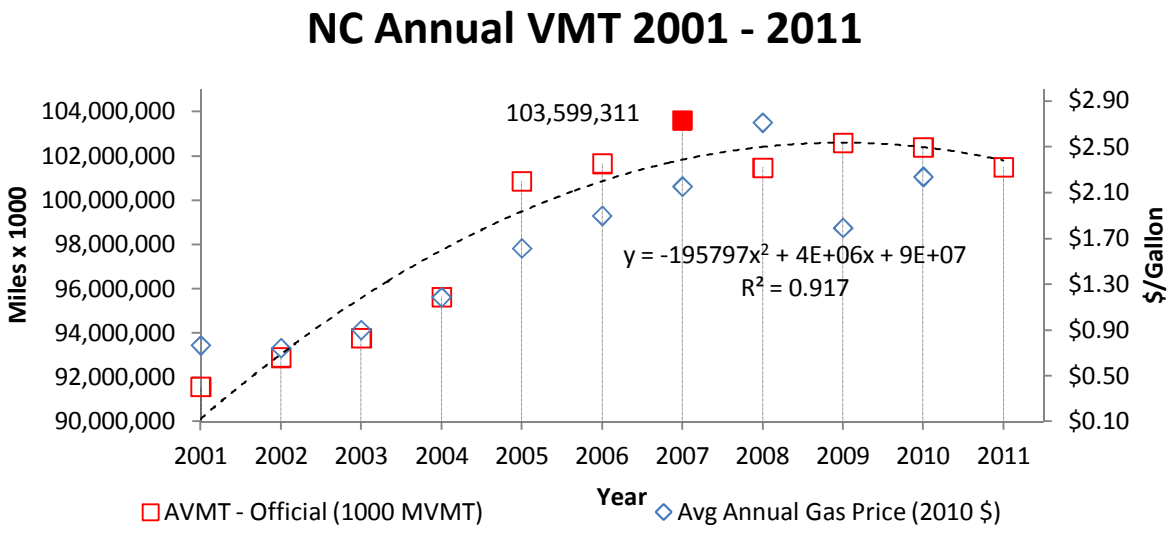
Figure 2-6: Licensed Drivers

NIMBYISM[3]- Great places are not static; they change in response to the world around them and in turn change the world. NIMBYISM is the desire to maintain the world as it is, or as it was in some past era. It often opposes new public infrastructure or private projects that change the look and feel of the region. NIMBYISM is driven by a bias towards the status quo, and a bias towards overestimating the negative impacts(Glaser, 2011).

2.5 Technological Factors

As **fuel costs** go up travel gets more expensive. Much research discusses how fuel cost affects driving. The Victoria Transportation Policy Institute (VPI) gives a range of elasticities around -0.15 in the short term(Victoria Transportation Policy Institute) with respect to fuel cost. For example, if fuel cost goes up by ten percent travel will drop by 1.5% in the short term. VPI defines short term as less than two years and the long term as fifteen or more years. The graph below shows how the cost of fuel affected travel in North Carolina between 2001 and 2011.

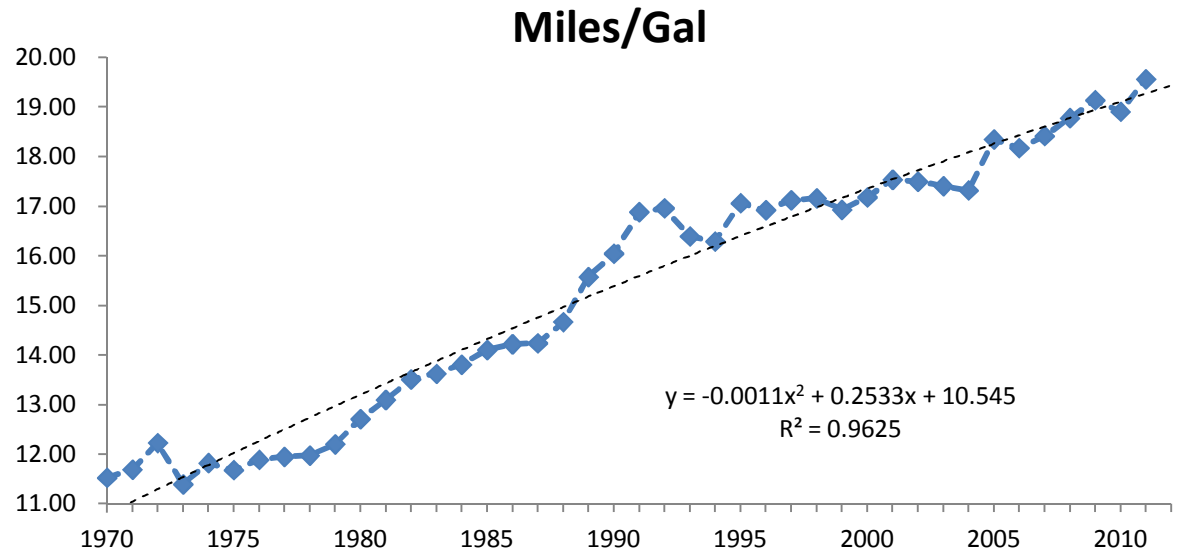
[3] NIMBY: Not in my back yard.



Source: NCDOT/Energy Information Administration

Figure 2-7: Vehicle Miles Traveled and Cost of Fuel

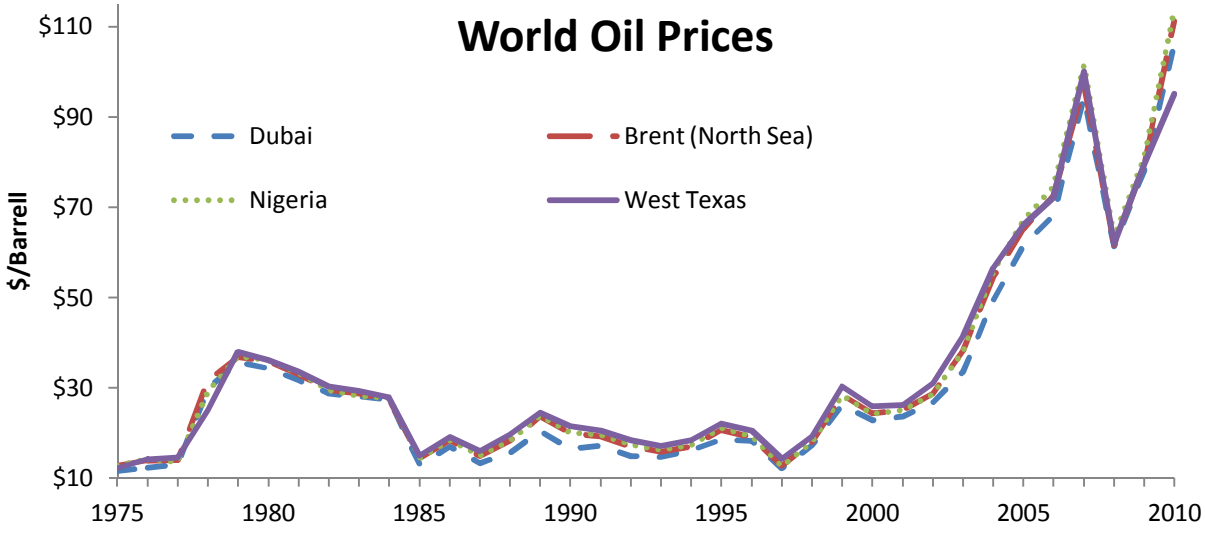
Between 1970 and 2012, **fuel economy** in North Carolina improved by 70.4% from 11.5 miles per gallon to 19.6 miles per gallon. The increase has been steady and shows no sign of slowing. Better fuel economy damps the effect of fuel costs and lowers the transportation revenues. Better fuel economy also lowers motor vehicle emissions of criteria pollutants and greenhouse gases.



Source: NCDOT

Figure 2-8: NC Miles/Gallon

The price of oil has increased by an order of magnitude (10X) since 1975. Figure 2-7 shows the change and that the growth in oil prices appears to be accelerating. High oil prices are often associated with recessions and low prices with economic growth. Evidence is mounting that the U.S. economy is not as dependent upon oil as it once was. In the 1970's, Americans defined demand for oil, however, nowadays it is the developing economies in Asia (*e.g.,* China) that are driving the price of crude oil(Denning, 2012).



Source: BP Statistical Review of World Energy 2012

Figure 2-9: World Oil Prices

System Age- Despite a large building program, over the past twenty years, much of North Carolina's highway system is getting old. Over the next few decades, we will face the need to rebuild much of this system to either meet current standards or to maintain serviceability based on the condition of the pavement and the subgrade.

2.6 Environmental Factors

From the 1990's through about 2010 poor **air quality** was an issue in North Carolina and the Triad. Beginning in 1990, Triad counties were classified as nonattainment for the one-hour ozone standard, the eight hour ozone standard and the $PM_{2.5}$ standard. Figure 2-9 and 2-10 show the improvements in air quality that the Triad has made. These improvements have come largely because of cleaner vehicles. Today, the Triad Counties meet the ozone and $PM_{2.5}$ standards.

Figure 2-10 shows the ozone levels for the monitoring stations around the Triad since 1994. Average ozone values at all of the Triad's ozone monitors have been falling since at least 2001, and most monitors have been declining since 1999. *During the same time, EPA changed the ozone standard from 0.085 ppm to the current level of 0.075 ppm*.

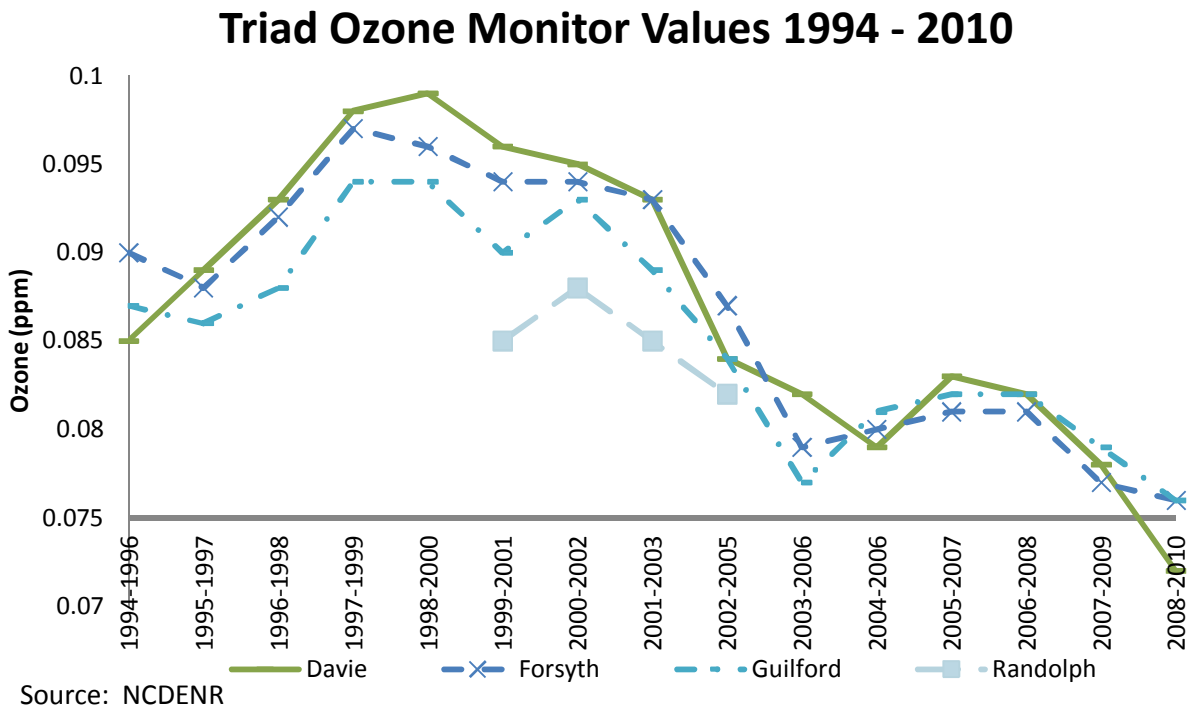


Figure 2-10: The Ozone Trend in the Triad

Fine particulate matter is a health problem because it is too small for our respiratory system to filter out. Fine Particulate Matter has two standards: an annual standard and a daily standard. Figure 2-11 shows how the annual concentrations of $PM_{2.5}$ have changed in the Triad since 1999.

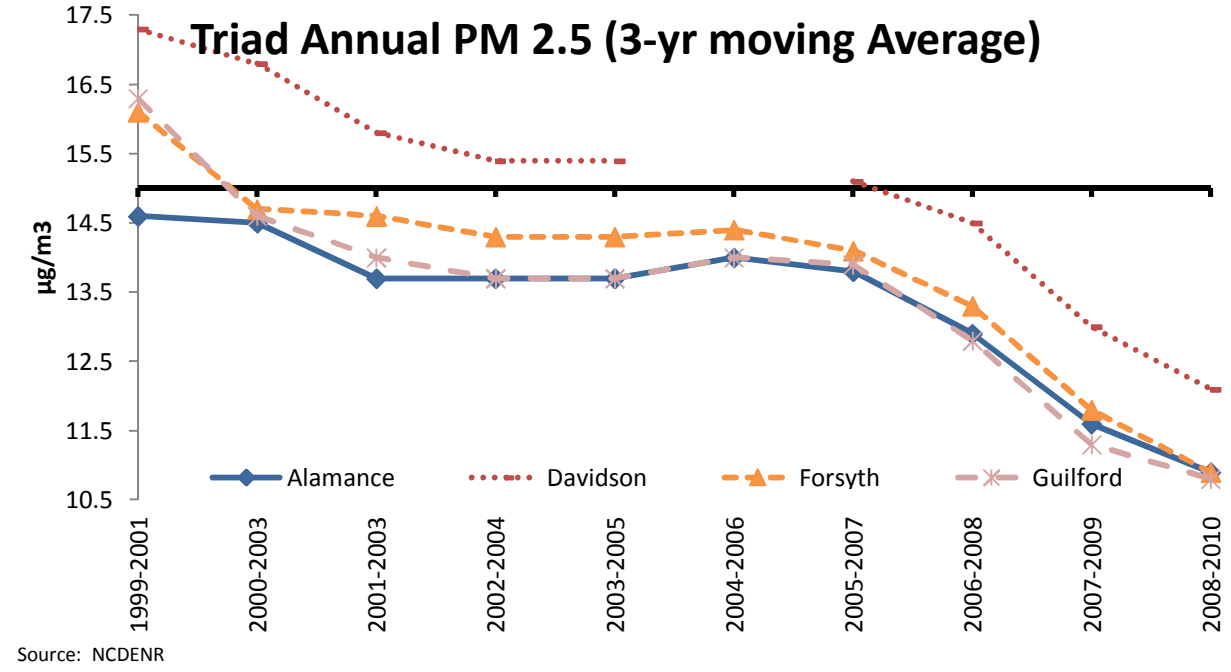


Figure 2-11: Annual PM 2.5 in the Triad

Many consider **climate change** to be *the issue* facing the nation. Climate change is often discussed in terms of the greenhouse gases, thought to increase temperatures and possibly humidity. The most common greenhouse gases are water vapor and carbon dioxide (CO_2). CO_2 is produced mainly by the decomposition of plants and animal respiration and forms part of the carbon cycle. However, some CO_2 is a byproduct of burning fuel for human activity. Most combustion occurs in the production of energy, and about a third of it involves transportation. CO_2 reduction options in transportation focus on the reduction of man-made combustion by reducing activity (*i.e.,* travel), or on more efficient engines.

Example policy options include reducing vehicle-miles of travel (VMT) and reducing the amount of CO_2 in vehicle exhaust through increased vehicle fuel efficiency. Hartgen estimated that U.S. transportation related greenhouse gas emissions in 2005 amounted to around 1400 kilotons per day of CO_2 equivalent. Without policy changes, this number would climb to around 2,100 kilotons by 2030. The recently approved changes to the fuel economy standards will save about 660 kilotons a day in 2030(David T. Hartgen, 2011).

Land Use and Urban Form are diverse and changing. Historically, most of the land, even in the core counties[4] has been rural. The Piedmont Together (formerly Triad Sustainability) project has developed maps showing existing land uses in all twelve Triad counties (http://www.partnc.org/documents/CivicForum1-DevelopmentPatternsPoster.pdf). Figure 2-12 shows the percentages of land in each of five categories (Rural, Rural-Transitional, Suburban, Urban, and Non-Residential). Many consider our development pattern and our urban form auto-dependent. Many have discussed the social costs and benefits of the automobile. Given the mobility advantage that automobiles give individuals, it seems likely that the automobile will be with us for the foreseeable future.

The Federal Clean Water Act drives efforts to provide good **water quality.** In North Carolina, the priority has been to improve water quality in the Neuse River and the Jordan Lake watersheds. USEPA and the North Carolina Division of Water Quality have cooperatively developed buffer rules and mitigation rules for various watersheds in the state. These rules have been focused on improving impaired streams although there have been unintended consequences to economic development and transportation. The chief impact of these rules has been to require larger stream buffers. When added to the preference for on-site mitigation of stream impacts and for minimizing stream loading these rules can add considerable cost in terms of mitigation and right-of-way acquisition. *Stream buffer rules applied to urban settings may make redevelopment of brownfield sites less attractive than otherwise*(Glaser, 2011).

[4] Alamance, Forsyth, Guilford. The MPO service areas also include parts of Davie, Davidson, Randolph, and Surry.

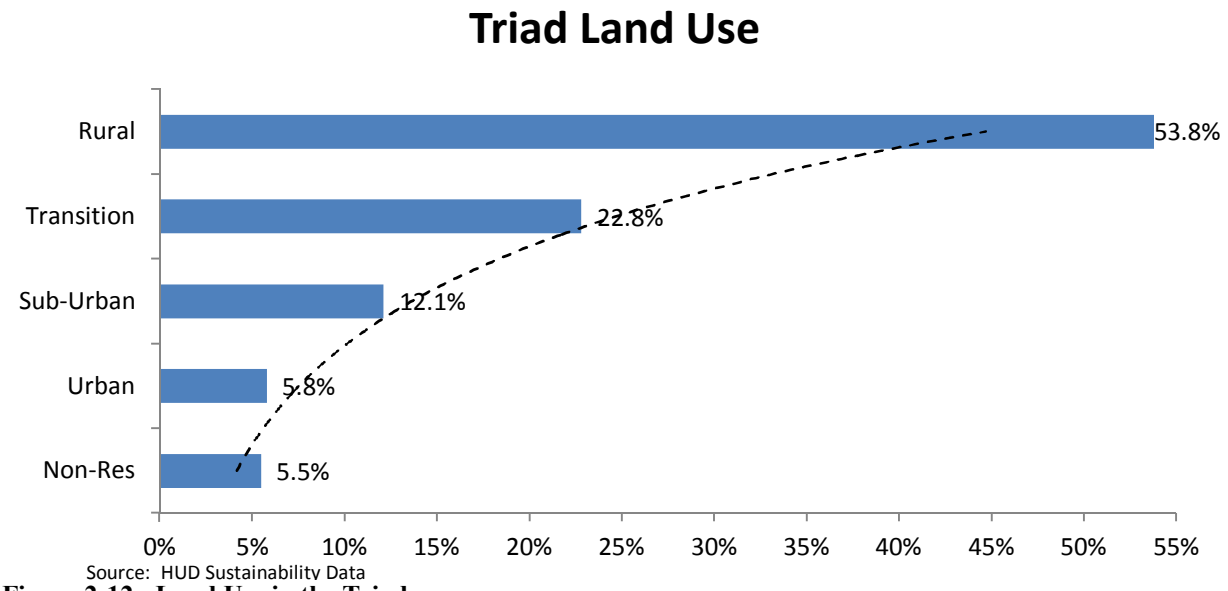


Figure 2-12: Land Use in the Triad

2.7 Legal Factors

Transportation is governed by a complex web of Federal, State, and Local Regulations. Some of the regulations affecting transportation delivery are discussed below.

The **National Environmental Policy Act (NEPA)** sets procedural requirements assessing the environment for federal actions. NEPA's goal is to ensure that the decision-makers on projects have access to all of the relevant data on project effects when making project decisions.

Metropolitan Planning Organizations are subject to North Carolina's **Open Meetings and Public Records Laws.** These statutes regulate how much access residents have to information developed with their tax dollars.

One outcome of the 2012 session of the North Carolina General Assembly was to classify Metropolitan Planning Organizations as State Boards and Commissions and require them to comply with the **North Carolina Ethics Law**. The impacts, to TAC and TCC members, of this change are:

- Monitor and avoid conflicts of interest in performing their official duties
- Participate in state ethics education training
- Not solicit or accept gifts from registered lobbyists, lobbyists' principals, and entities that have certain relationships with the RPO or MPO on which the individual serves
- Not use their public position for private gain, including not using their public position in nongovernmental advertising that advances their private interests or those of others, or in any advertising or public service announcement that is paid for with state funds
- Disclose their economic interests on an annual basis by filing a "Statement of Economic Interest" (SEI) – *the first SEI filing is due April 15, 2013*(Houston, 2012).

As recipients of federal money, transportation agencies are subject to **Title VI** of the Civil Rights Act of 1964 and **Environmental Justice.** The goals of these two federal actions are to ensure that we treat our residents fairly. In practice, this is a difficult proposition as we find that decisions made in the past affect the perception of the decisions available today.

Transportation conformity is often called air quality conformity. A conformity determination is the statement by an MPO Board that the MPO's Transportation Plan or Transportation Improvement Program conforms to the *intent* of the State's Implementation Plan (SIP). *This statement is based on the information that the transportation plan is consistent with SIP and that nothing in the transportation plan conflicts with any element of the SIP.* Before the MPO Board can make this determination it must be able to answer yes, or not applicable to each of the following criteria:

1. The conformity analysis needs to be based on the latest planning assumptions[5],
2. The emissions estimates must be based on the most recent motor vehicle emissions model approved by the United States Environmental Protection Agency[6],
3. That local, regional, state, and federal agencies must participate in developing the conformity analysis[7],
4. The transportation plan must include any regulatory transportation control measures, nonattainment[8] or maintenance area, included in the SIP[9],
5. The MPO is to have a financial plan indicating that the money to build and maintain the transportation system will be available[10], and
6. The expected emissions from the Long Range Transportation Plan must be less than the amount allowed in the SIP[11], or less than the emissions expected if the plan were not implemented.[12]

Without a valid conformity determination, a MPO in a nonattainment, or maintenance area, cannot adopt a long range transportation plan, adopt a transportation improvement program, nor can a MPO advance a project to construction.

2.8 Local Issues

Section 2.8 discusses local level transportation issues. The key issues in this section are where people are going and what their transportation concerns are.

2.8.1 Commute Pattern

Figure 2-13 shows the 2010 commute patterns between the twelve counties of the Piedmont Triad Region. The High Point MPO includes parts of four counties (Davidson, Forsyth, Guilford,

[5] 40 CFR Part 93.110
[6] 40 CFR Part 93.111
[7] 40 CFR Part 93.112
[8] A nonattainment area is a region that is currently violating an air quality standard, a maintenance area is a region that has violated an air quality standard, but that is now meeting all the air quality standards. For simplicity nonattainment refers to both, regardless of status.
[9] 40 CFR Part 93.113(b)
[10] 40 CFR Part 93.108
[11] 40 CFR Part 93.118
[12] 40 CFR Part 93.119

and Randolph) and our residents make up a substantial number of the intercounty commuters documented in the Census. The desire lines in Figure 2-11 show a strong relationship between the four central counties of the Triad region. Based on the width of the desire lines the Triad appears strongly connected to the Research Triangle but only weakly connected to the Metrolina Region.

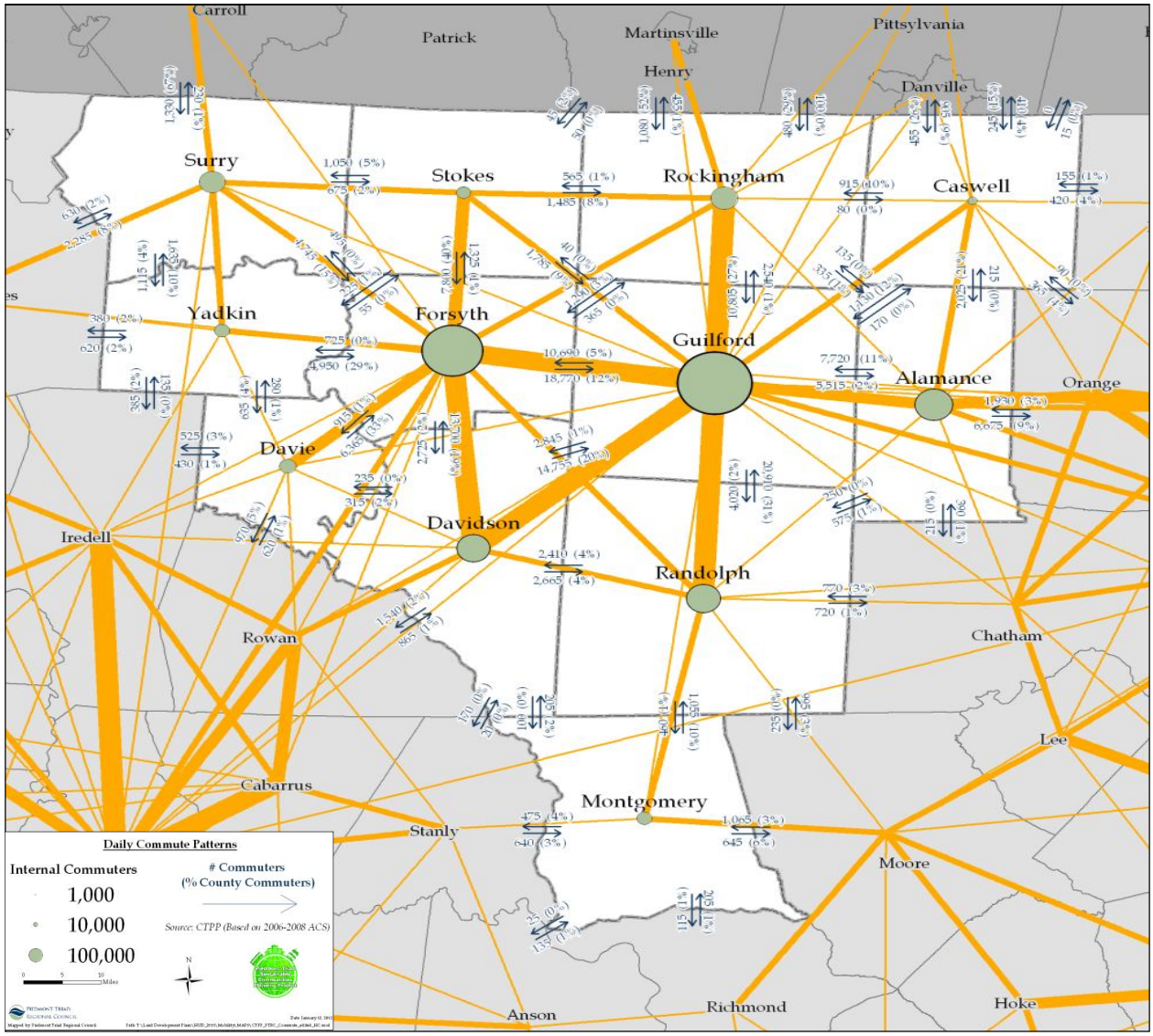


Figure 2-13: Regional Commute Patterns

2.8.2 Identifying Goals

To identify local issues, MPO staff distributed a survey on transportation issues and projects to the High Point Chamber of Commerce members. The survey went to all members of the High Point Chamber of Commerce. Approximately 200 of 1600 members responded.

Figure 2-14 shows the respondents' opinions of twenty-one overall goals for the transportation system. The goals are ranked according to what the respondents believed to be most important. Based on this survey, the most important goal for business owners is well

maintained roads followed by replacing outdated bridges, which is closely related to maintenance. Improved roads to Greensboro are the fourth goal and are consistent with strong interactions between High Point and Greensboro.

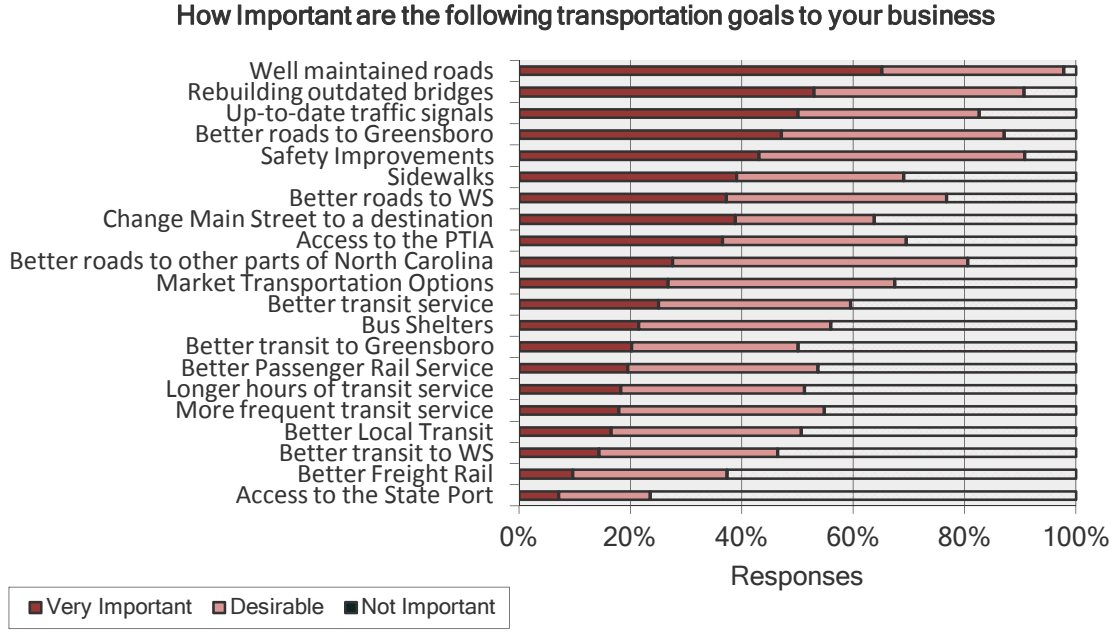


Figure 2-14: Transportation Goals

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